Building Compatible Websites

Using Emerging Web Technologies

Session 204

These are confidential sessions—please refrain from streaming, blogging, or taking pictures.

Building Compatible Websites

Using Emerging Web Technologies

Vicki Murley
Safari Technologies Evangelist

Compatibility

CSS
Effects

HTML 5
Audio and Video

HTML 5
Offline Data

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If a customer pays you, when is the money really yours?
The New York Times
Saturday, May 23, 2009 Last Update: 11:45 AM ET
How about the next day.
HSBC
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ASK
EASY VIRTUE
NOW PLAYING
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BUSINESS
TECHNOLOGY
SPORTS
SCIENCE
HEALTH
OPINION
ARTS
Books
Movies
Music
President's Detention Plan Tests American Legal Tradition
By WILLIAM GLABERSON
Determining the constitutionality of President Obama's proposal for "prolonged detention" of terror suspects without trial is likely to require a national look in the mirror.
· Times Topics: Detainees | Habeas Corpus
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In Area Packed With Prisons, a Split on Adding Jihadists
Rick Smith/Associated Press
A Casino in the Place of a Fallen Steel Giant
By STEVE FRIESS
The people of Bethlehem, Pa., a long-depressed steel town, have high hopes for the $743 million Sands Casino Resort
OPINION »
WEEKEND OPINIONATOR
Obama's Daisy Chain
Do Barack Obama and Dick Cheney really differ on security?
· Collins: Cowboys Getting Wimpy| Comments (194)
· Herbert: Absence of Proof
· Blow: G.O.P.'s Forgotten Northeast
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Book Review
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N
NE
E
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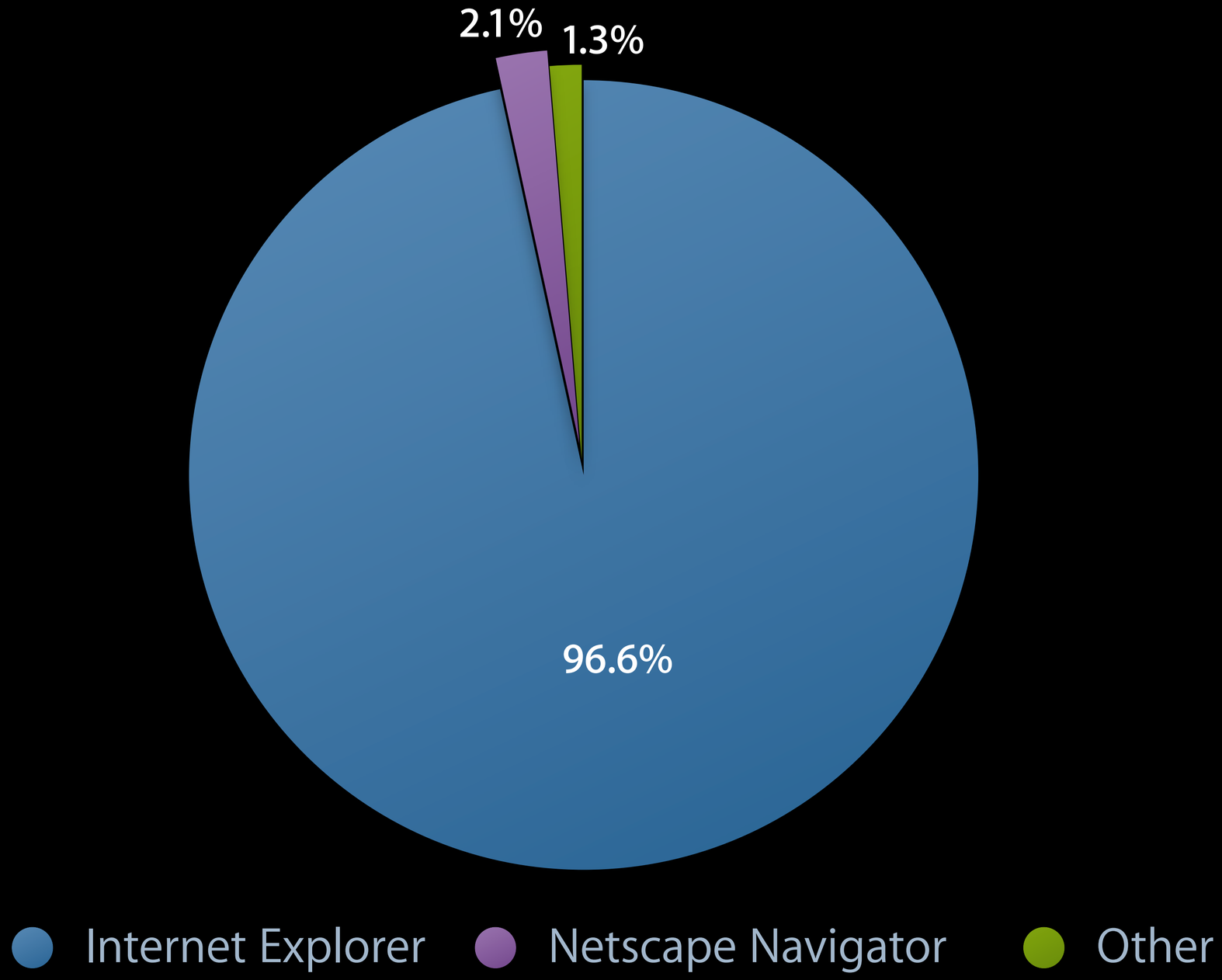
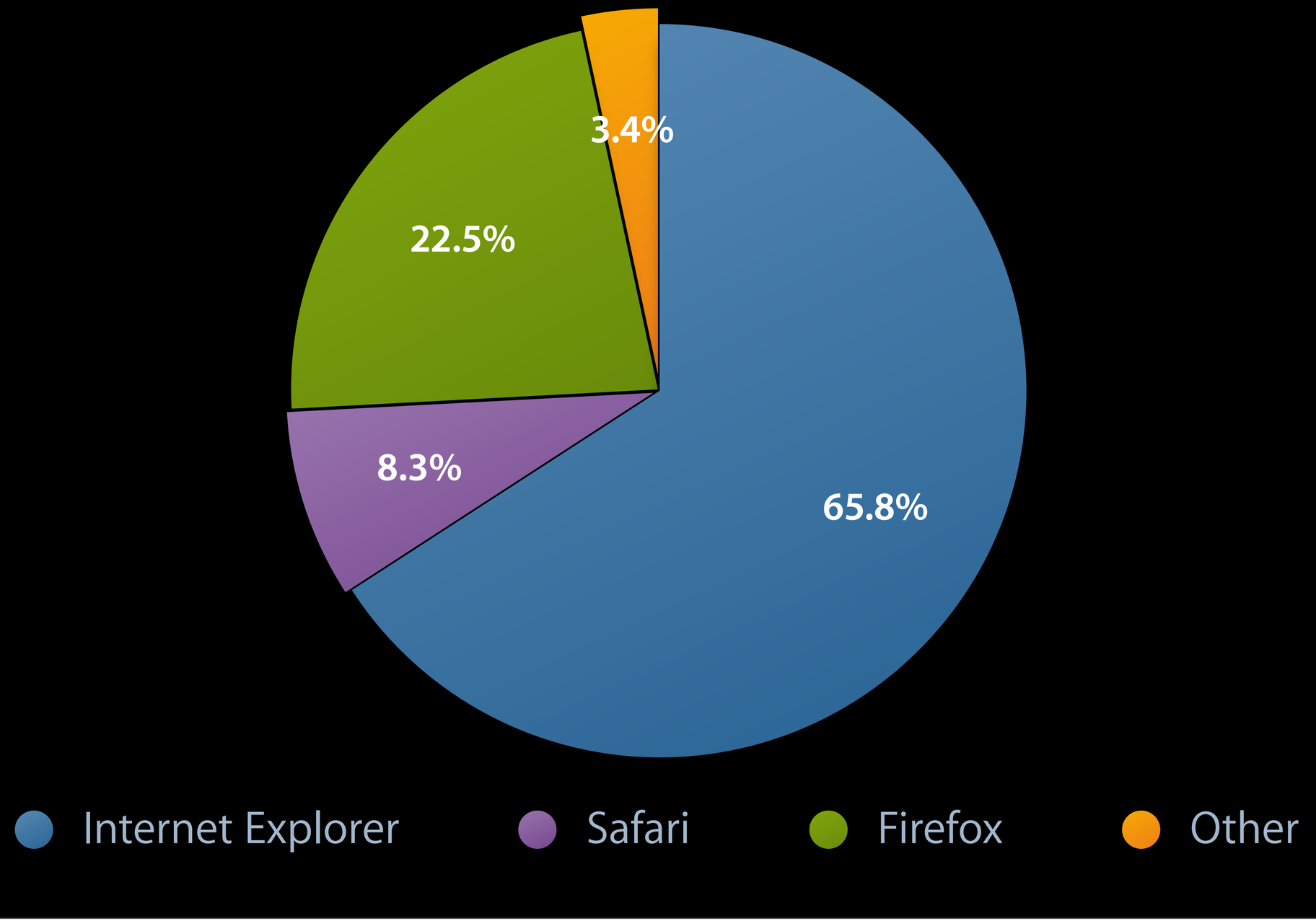
S
SW
W
NW

2002 Browser Market Share



2009 Browser Market Share



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Deliver the Best Possible User Experience

To the Largest Number of Users

The Roadmap to Success

Common Coding Pitfalls
…and how to avoid them!

Fallback Techniques

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Fallback Techniques

CSS Effects

HTML 5 Media Elements

HTML 5 Offline Data

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HTML 5 Offline Data

```
- (id)init {
  if (self = [super init]) {
    element = nil;
    atomicElementView = nil;
    atomicElementFlippedView = nil;
    self.frontViewIsVisible=YES;
    self.hidesBottomBarWhenPushed = YES;
  }
  return self;
}

- (void)loadView {
  // create and store a container view

  UIView *localContainerView = [[UIView alloc] initWithFrame:
  [[UIScreen mainScreen] applicationFrame]];
  self.containerView = localContainerView;
  [localContainerView release];

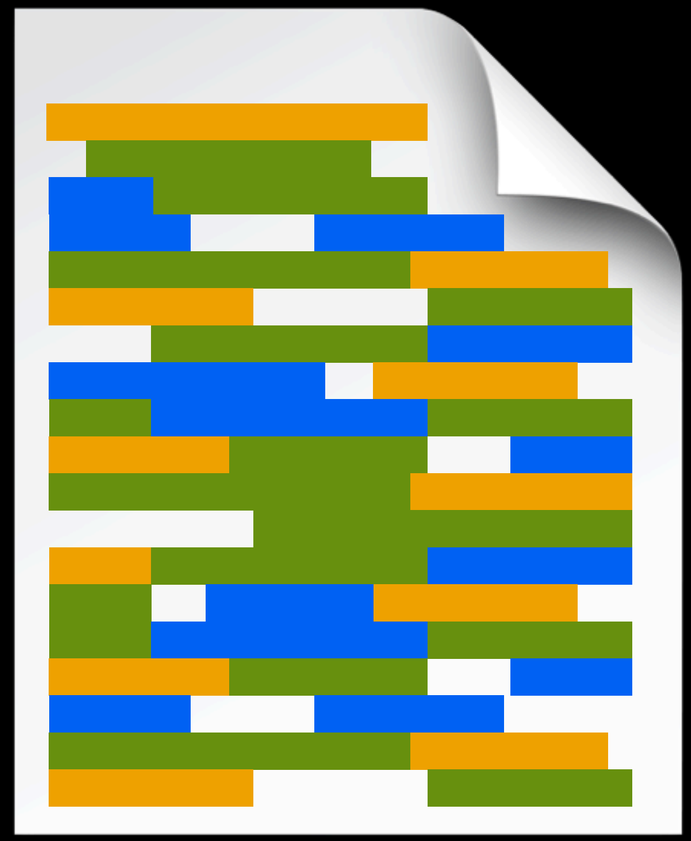
  containerView.backgroundColor = [UIColor blackColor];
}
```

Browser Sniffing

What's a User Agent String?

What's a User Agent String?

```
navigator.userAgent
```



Anatomy Of A User Agent String

```
Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_5_7; en-us)
AppleWebKit/530.17 (KHTML, like Gecko)
Version/4.0 Safari/530.17
```

Safari Version Number	Version/4.0
Safari Build Number	Safari/530.17
WebKit Build Number	AppleWebKit/530.17
Platform Information	Intel Mac OS X 10_5_7

Parsing the User Agent String

It's 1998 again!

Mozilla/4.0 (compatible; MSIE 4.01; Windows NT)

```
var isIE = navigator.userAgent.indexOf('MSIE') != -1;
```

Mozilla/4.06 [en] (WinNT; I; Nav)

```
var isNN = navigator.userAgent.indexOf('Nav') != -1
    && navigator.userAgent.indexOf('4') != -1;
```

Branching the Code

Still in 1998!

Mozilla/4.0 (compatible; MSIE 4.01; Windows NT)

```
if (isIE) {

// image rollover
...
document.all
...

}
```

Mozilla/4.06 [en] (WinNT; I; Nav)

```
else if (isNN) {

// image rollover
...
document.layers
...

}
```

All Other Browsers

```
else {

// no rollover,
// static image

}
```

So What Happens When…

- New information is added to the string

```
Mozilla/4.0 (compatible; MSIE 4.01; Windows NT)
```

```
Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 6.1; WOW64; Trident/4.0;
SLCC2; Media Center PC 6.0; InfoPath.2; MS-RTC LM 8)
```

- Version numbers change

```
Opera/10.00 (Windows NT 5.1; U; en) Presto/2.2.0
```

http://my.opera.com/hallvors/blog/2008/12/19/10-is-the-one

...New Features Are Added

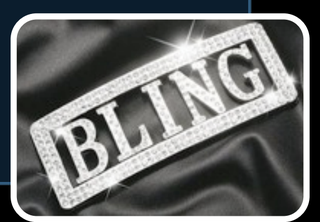
Moving beyond 1998

Mozilla/4.0 (compatible; MSIE 4.01; Windows NT)

```
if (isIE) {

// image rollover
...
document.all
...

}
```

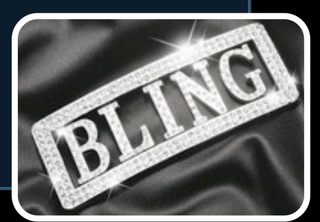


Mozilla/4.06 [en] (WinNT; I; Nav)

```
else if (isNN) {

// image rollover
...
document.layers
...

}
```



All Other Browsers

```
else {

// no rollover,
// static image

}
```

...Features Are Removed

Moving beyond 1998

Mozilla/4.0 (compatible; MSIE 4.01; Windows NT)

```
if (isIE) {

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...
document.all
...

}
```

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else if (isNN) {

// image rollover
...
document.layers
...

}
```

All Other Browsers

```
else {

// no rollover,
// static image

}
```

...New Browsers Are Released

Way past 1998 now!

Mozilla/4.0 (compatible; MSIE 4.01; Windows NT)

```
if (isIE) {

// image rollover
...
document.all
...

}
```

Mozilla/4.06 [en] (WinNT; I; Nav)

```
else if (isNN) {

// image rollover



}
```

All Other Browsers

```
else {

// no rollover,
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```

...New Browsers Are Released

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```
else if (isNN) {

// image rollover



}
```

All Other Browsers

```
else {

// no rollover,
// static image

}
```

Feature Detection

A Better Approach

- Test and branch on features—not the current browser

User Agent String Changes

New Versions of Existing Browsers

Features Added

Features Removed

New Web Browsers

Common Feature Detection Techniques

```
if (window.XMLHttpRequest) { ... }
```

```
if (window.openDatabase()) { ... }
```

```
if (document.body.innerHTML) { ... }
```

```
if (document.body.contentEditable) { ... }
```

Common Feature Detection Pitfalls

Oops!

- Unnecessary function execution
- Unnecessary property value computation
- Generating false negatives

```
if (document.body.contentEditable) { ... }
```

Common Feature Detection Techniques

```
if (window.openDatabase()) {...}
```

```
if (document.body.innerHTML) {...}
```

```
if (document.body.contentEditable) {...}
```

Feature Detection Best Practices

Prioritize web standards

- W3C implementations are more likely to be the same
- Test probable conditions first

```
if (document.getElementById) {
    // standards are the best!
    ...
}
else if (document.all) {
    // not a modern browser
    ...
}
```

Feature Detection Best Practices

Keep it localized

- Code blocks should pertain to tested feature
- Don’t use feature detection for browser sniffing!

The Roadmap to Success

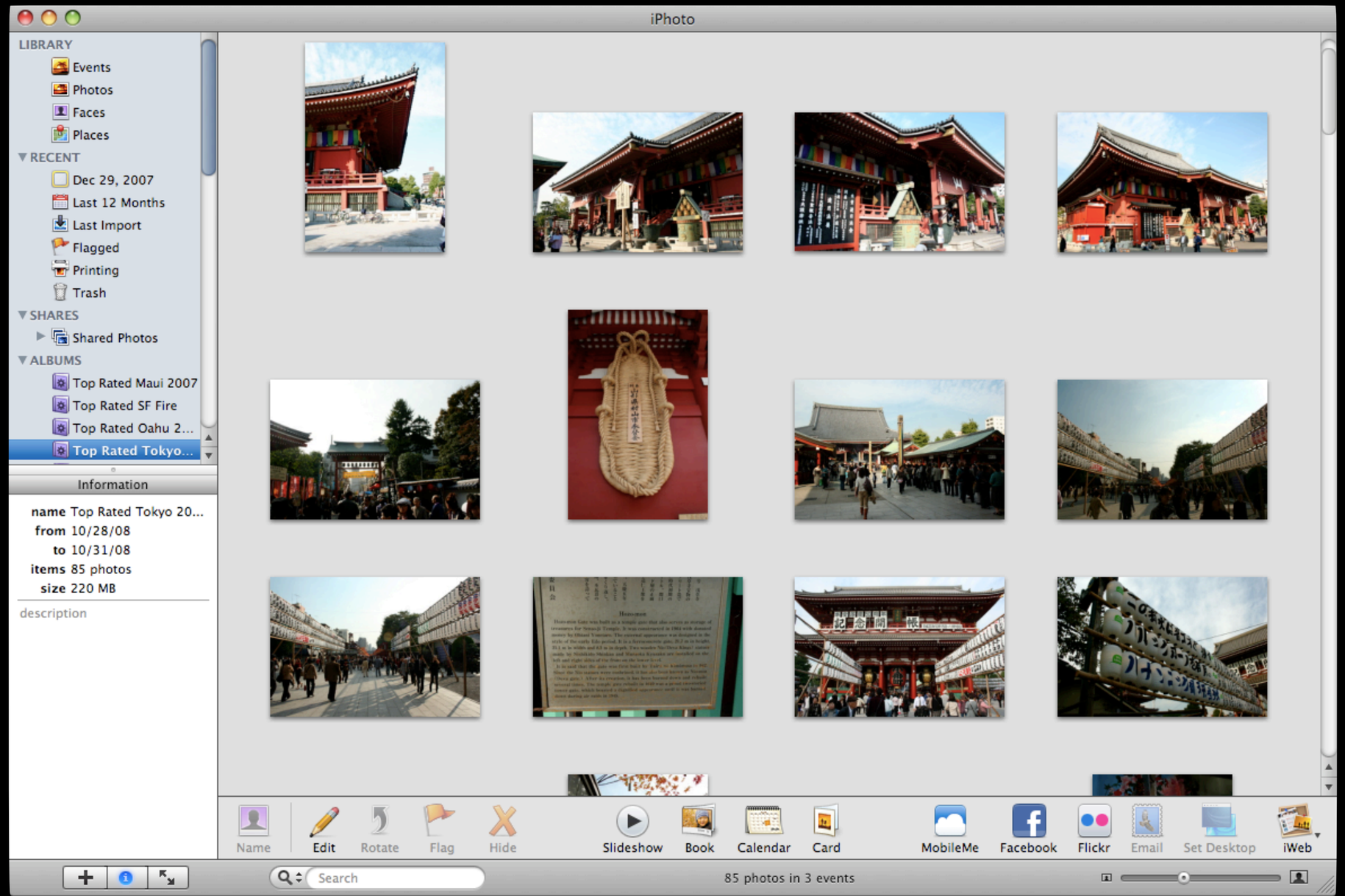
Common Coding Pitfalls
…and how to avoid them!

Fallback Techniques

CSS Effects

HTML 5 Media Elements

HTML 5 Offline Data


iPhoto
LIBRARY
Events
Photos
Faces
Places
RECENT
Dec 29, 2007
Last 12 Months
Last Import
Flagged
Printing
Trash
SHARES
Shared Photos
ALBUMS
Top Rated Maui 2007
Top Rated SF Fire
Top Rated Oahu 2...
Top Rated Tokyo...
Information
name Top Rated Tokyo 20...
from 10/28/08
to 10/31/08
items 85 photos
size 220 MB
description
Name
Edit
Rotate
Flag
Hide
Slideshow
Book
Calendar
Card
MobileMe
Facebook
Flickr
Email
Set Desktop
iWeb
Search
85 photos in 3 events

MobileMe Gallery - Tokyo 2008 (85 items)

http://www.me.com/gallery/#100008/IMG_3725

Google

MobileMe Gallery - Tokyo 2008 (8...

http://gallery.me.com/vmurley/100008 news logout

My Gallery

▼ ALBUMS

Tokyo 2008

Info

title	IMG_3725.JPG
date	10/28/2008 8:45 PM
original size	1024 x 683 pixels
	185.81 KB

description

Back to Gallery

CSS Effects

- Text and image effects
- Transforms
  - translate, skew, scale and rotate
- Transitions
  - simple animations
- Animations
  - fine-grained control, and DOM events

Related Sessions

Adding Innovative Styling and Animation to Webpages with CSS Effects	Mission Tuesday 3:30PM

CSS Effects

Fallback techniques

- Automatic graceful fallback
- Dynamic fallback with JavaScript
- Media queries

CSS Effects

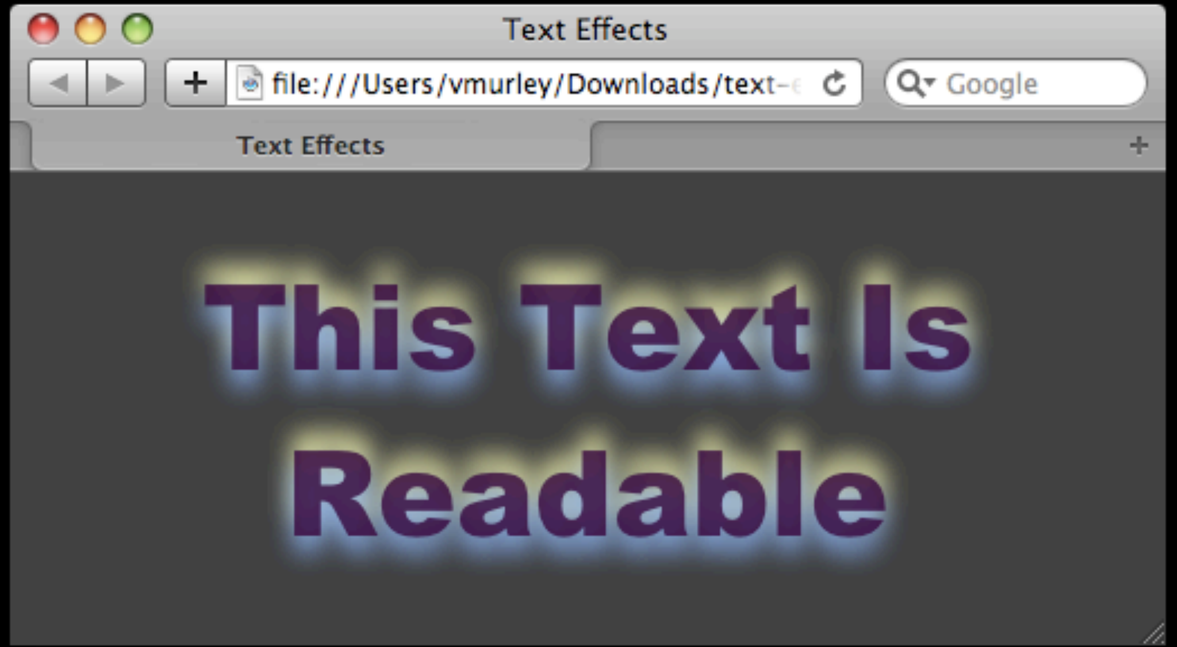
Fallback techniques

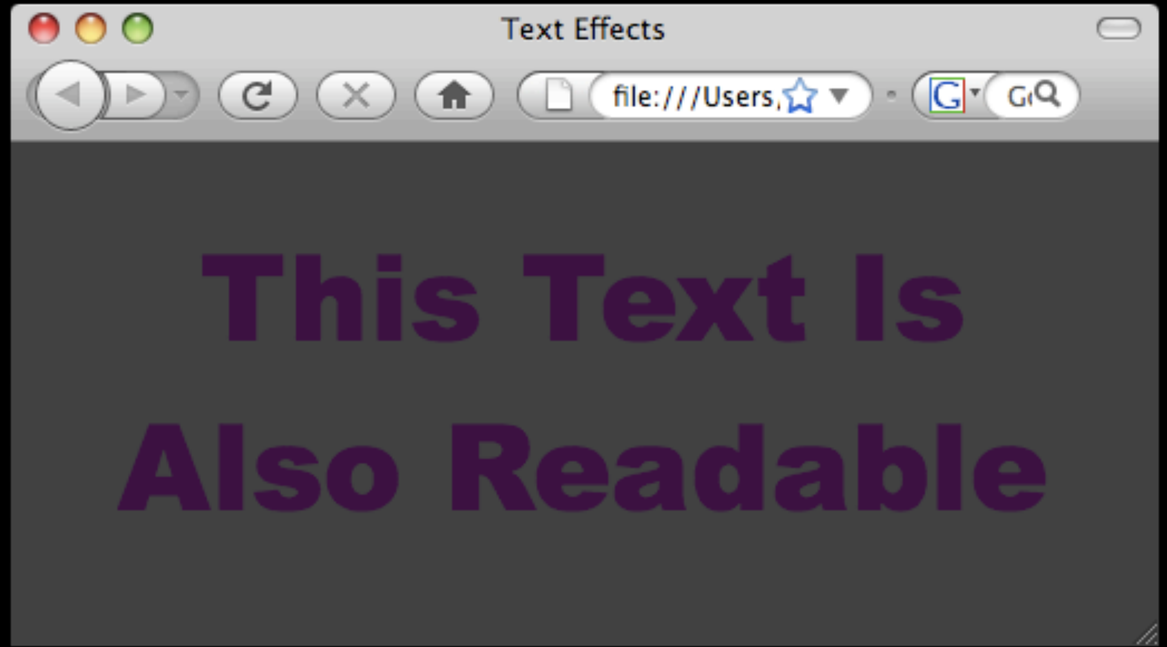
- Automatic graceful fallback
- Dynamic fallback with JavaScript
- Media queries

Fallback Techniques for CSS Effects

Automatic graceful fallback

- Unsupported CSS properties are ignored
- Relinquish the pixel-for-pixel match





Demo

Adding Visual Interest to Webpages

Dean Jackson

Don’t Forget…

- Always specify a fallback font
- Choose web fonts wisely
  - if your layout depends on it, check for comparable metrics

Don’t Forget…

- Prefixes are preliminary
  - -webkit for WebKit-based browsers
  - -moz for Gecko-based browsers

```
div {
    -webkit-border-radius: 5px;
    -moz-border-radius: 5px;
}
```

CSS Effects

Fallback techniques

- Automatic graceful fallback
- Dynamic fallback with JavaScript
- Media queries

Dynamic Fallback with JavaScript

If you're already using JavaScript animations…

- CSS animations are triggered by JavaScript
  - Easy to modify code
- Use CSS animations for best performance

```
if ('webkitTransition' in document.body.style)
{
   // transitions exist
}
```

CSS Effects

Fallback techniques

- Automatic graceful fallback
- Dynamic fallback with JavaScript
- Media queries

Media Queries

For Transforms, Transitions, and Animations

- Tailor CSS based on characteristics of the display
- Media types
  - screen, print, tty, tv, all
- Media features
  - transform-2d, transform-3d, transition and animation

```
<link rel="stylesheet" media="screen and (transform-2d)" href="main.css">
```

Media Queries

For Transforms, Transitions, and Animations

- Load a style sheet or query inline
- Use logical operators to compose complex queries

```
@media screen and (transform-2d and transition) {
    div {
      -webkit-transform: scale(0.8)
      -webkit-transition: -webkit-transform 1s linear;
    }

    div:hover {
       -webkit-transform: scale(1.2);
    }
}
```

The Roadmap to Success

Common Coding Pitfalls
…and how to avoid them!

Fallback Techniques

CSS Effects

HTML 5 Media Elements

HTML 5 Offline Data

HTML 5 Media Elements

Practical uses and fallback techniques

- Why HTML?
- Creating compatible markup
- Creating compatible dynamic content

HTML 5 Media Elements

Practical uses and fallback techniques

- Why HTML?
- Creating compatible markup
- Creating compatible dynamic content

HTML 5 Media Elements

Why HTML?

- Simplifies media playback on the web

```
<video src="wwdc.mp4"></video>
```

HTML 5 Media Elements

Why HTML?

- Simplifies media playback on the web
- A standards-based approach

HTML 5 Media Elements

Why HTML?

- Simplifies media playback on the web
- A standards-based approach
- Best way to display video in Safari on all platforms
  - Identical code
  - Optimized user experience

Related Sessions

Sophisticated Media Playback and Animation Through Open Web Standards	Mission Wednesday 3:30PM

HTML 5 Media Elements

Practical uses and fallback techniques

- Why HTML?
- Creating compatible markup
- Creating compatible dynamic content

Creating Compatible Markup

- Basic content fallback
- Working with multiple media resources

Creating Compatible Markup

Basic Content Fallback

- Fallback content nested within opening and closing <video> tags
  - Displayed if <video> tag is not supported
- Nested fallback content NOT displayed for errors
  - File not found
  - Corrupt or broken files
  - Unsupported codecs

```
<video src="wwdc.mp4">
    <embed src="wwdc.mp4" />
</video>
```

```
<video src="wwdc.mp4" >
    type="video/mp4" >
</video>
```

Creating Compatible Markup

Working with multiple media resources

- Built-in dynamic support with src
- Safari supports any installed linear codec
  - Default set of installed codecs
  - User-installed codecs

```
<video src="wwdc.mp4"></video>
```

Working with Multiple Media Resources

Showing the best available encoding on every platform

- Use the <source> tag
- User agent iterates through the list and:
  - Attempts to play first supported encoding
  - Does not continue after a failure

```
<video>
    <source src="safariDemo.mp4">
    <source src="safariDemo.ogg">
    <source src="safariDemo.mpa">
</video>
```

Working with Multiple Media Resources

Optimizing with the <source> tag

- Avoid unnecessary network requests
  - Use the type attribute to specify a mime type

```
<video>
    <source src="safariDemo.mp4" type="video/mp4">
    <source src="safariDemo.ogg" type="video/ogg">
    <source src="safariDemo.mov" type="video/quicktime">
    <source src="safariDemo.mpa" type="video/mpeg" >
</video>
```

Working with Multiple Media Resources

Optimizing with the <source> tag

- Choose an optimized resource
  - Use the media attribute to query device characteristics

```
<video>
  <source src="safariDemo.mp4" type="video/mp4"
    media="screen and (min-device-width:600px)">
  <source src="safariDemo.3gp" type="video/3gp"
    media="screen and (device-width:340px)">
</video>
```

HTML 5 Media Elements

Practical uses and fallback techniques

- Why HTML?
- Creating compatible markup
- Creating compatible dynamic content

Creating Compatible Dynamic Content

- Detecting <audio> and <video> support
  - Generating markup on the fly
  - Toggling visibility of customized user interfaces
- Detecting codec support
- Directing users to playable content

Detecting <audio> and <video> support

Using JavaScript for dynamic content

```
if (!('HTMLVideoElement' in window)) {
   // <video> not supported - hide my custom video controls!
   document.getElementById(‘myControls’).style.display = 'none';
}
```

Detecting Codec Support

Using JavaScript for dynamic content

- Probably
- Maybe
- No

```
myVideo.canPlayType('video/mp4')
```

Detecting Codec Support

Using JavaScript for dynamic content

```
var support = myVideo.canPlayType('video/mp4');
if (support != "probably") {
  /* use a plugin, if you've got one */
  ...
  ...
}

else {
  /* use the video element */
}
```

HTML 5 Media Elements

Practical uses and fallback techniques

- Why HTML?
- Creating compatible markup
- Creating compatible dynamic content

The Roadmap to Success

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Fallback Techniques

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HTML 5 Offline Data

Storing Data Offline

The current state of affairs

- Cookies
- Syncing to the cloud

Enter HTML 5…

Revolutionary ways to store data

- LocalStorage and SessionStorage
  - Simple key/value storage
- SQL API
  - Database storage for structured data
- Application cache
  - Store all of the resources for your web application locally

Benefits of Offline Storage

- Open web standards
- Reduced code complexity
- Fast data access
- Functional without a network connection

Related Sessions

Local Data Storage and Offline Web Applications for Safari	Russian Hill Wednesday 3:30PM

HTML 5 Offline Data

What is there really to fall back to?

- No substitute for
  - Structured data storage
  - Offline applications
- One solution
  - Modify or hide UI components specific to offline functionality

HTML 5 Offline Data

Checking for offline data functionality

- Key/value storage

```
if ('localStorage' in window) { ... }
if ('sessionStorage' in window) { ... }
```

- SQL API for structured data storage

```
if ('openDatabase' in window) { ... }
```

- Offline application cache

```
if ('applicationCache' in window) { ... }
```

Demo

Beth Dakin
Safari and WebKit Engineer

What You've Learned

- Use feature detection for code branches
- CSS enhancements are incredibly easy to add
- HTML 5 <audio> and <video> elements
  - Simple fallback mechanism
  - Fine-grained control for codecs
- HTML 5 offline data is a killer feature, and simple to detect

More Information

Vicki Murley
Safari Technologies Evangelist
vicki@apple.com

Documentation
Safari Dev Center
http://developer.apple.com/safari

Related Sessions

Adding Innovative Styling and Animation to Webpages with CSS Effects	Mission Tuesday 3:30PM
Sophisticated Media Playback and Animation Through Open Web Standards	Mission Wednesday 3:30PM
Local Data Storage and Offline Web Applications for Safari	Russian Hill Wednesday 3:30PM
Improving Accessibility in Web Applications	Russian Hill Friday 9:00AM

Labs

WebKit Lab	OS X Lab D Friday 12:00 - 1:45 PM

Q&A

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